

**CLAIMS:**

1. A method for controlling at least one executable on a blade server having a controller accessible to the blade server and to at least one blade having access to a storage device in association with said controller, said controller having access  
5 to a source snapshot of the at least one executable stored on the storage device , the method comprising:  
selecting an available one of said blades for loading an instance of a running snapshot associated with said source snapshot; and  
loading the instance of the running snapshot to the available one of said  
10 blades.
2. The method of Claim 1, further comprising:  
generating an intermediate snapshot from the running snapshot.
3. The method of Claim 2, further comprising:  
storing the intermediate snapshot in a repository adapted to store one or  
15 more intermediate snapshots each generated from a respective running snapshot and being further adapted to store an initial snapshot.
4. The method of Claim 3 further comprising:  
instantiating the initial snapshot or one of the intermediate snapshots in the repository.
- 20 5. The method of Claim 2, wherein the running snapshot associated with said source snapshot is the source snapshot.
6. The method of Claim 2, wherein the running snapshot associated with said source snapshot is generated from the source snapshot.
7. The method of Claim 3, wherein the running snapshot associated with said  
25 source snapshot is an intermediate snapshot stored in the repository.

8. The method of Claim 3, wherein the running snapshot associated with said source snapshot is generated from an intermediate snapshot or from an initial snapshot stored in the repository.

9. A method for providing access to a blade associated with a blade server  
5 via at least one virtual bridged Local Area Network (LAN), the method comprising:

configuring a switch coupled to said blade server for allowing access to said at least one virtual bridged LAN; and

loading an agent to said blade being configured to provide access to said at  
10 least one virtual bridged LAN.

10. A method for configuring a switch associated with a blade server for providing access to at least one virtual bridged Local Area Network (LAN), the method comprising:

accessing configuration data stored on an accessible storage device; and  
15 relaying said configuration data to said switch for providing access to said at least one virtual bridged LAN.

11. A switch configuration apparatus for configuring a switch associated with a blade server for providing access to at least one virtual bridged Local Area Network (LAN), the apparatus comprising:

20 a configuration data access unit for accessing configuration data stored on an accessible storage device; and

a switch configuration unit coupled to said configuration data access unit for relaying said configuration data to said switch for providing access to said at least one virtual bridged LAN.

25 12. A method for providing access to a blade associated with a blade server via at least one virtual bridged Local Area Network (LAN), the method comprising:

configuring an image of agent for providing access to said at least one virtual bridged LAN; and

loading an instance of said image to said blade for allowing said blade to access said at least one virtual bridged LAN.

- 5    **13.**    A method for providing access to a blade associated with a blade server via at least one virtual bridged Local Area Network (LAN), the method comprising:

monitoring a Network Interface Card (NIC) coupled to said blade; and

- 10    encoding network packets received on said NIC for providing said blade with access to said at least one virtual bridged LAN.

- 14.**    The method of Claim 13, wherein said monitoring includes:

observing idle duration of said NIC; and

migrating to a redundant NIC for providing network fault tolerance if said idle duration is substantially longer than a predefined duration.

- 15    **15.**    The method of Claim 14, wherein:

the migrating is performed locally by an agent coupled to the NIC; and

the agent is adapted to convey data indicative of said migrating to a controller coupled to the blade server.

- 20    **16.**    A method for providing tolerance to at least one executable loaded to a blade accessible to a blade server, the method comprising:

receiving data indicative of migration of said blade to a redundant NIC;

detecting the operating status of a switch accessible by said blade; and

- 25    if the detected operating status indicates that said switch is not operating for a predetermined duration, bypassing a connection between said switch and said blade.

17. The method of Claim 16, wherein if said detected operating status indicates that said switch is not operating for a predetermined duration the method further comprises:

alerting fault in said switch.

5 18. The method of Claim 16, wherein if said detected operating status indicates that said switch is operating the method further comprises:

loading an instance of said at least one executable on to a different blade accessible to said blade server.

19. The method of Claim 18 wherein if said detected operating status indicates  
10 that said switch is operating, the method further comprising:

alerting fault in said blade.

20. A controlling apparatus for controlling at least one executable on a blade server having a controller accessible to the blade server and to at least one blade having access to a storage device in association with said controller, said  
15 controller having access to a source snapshot of at least one executable stored on the storage device, the controlling apparatus comprising:

a blade selector for selecting an available one of said blades for loading an instance of a running snapshot associated with said source snapshot; and

a snapshot loader for loading the instance of the running snapshot to the  
20 available one of said blades selected by the blade selector.

21. The controlling apparatus of Claim 20, further comprising:

a snapshot generator for generating an intermediate snapshot from the running snapshot.

22. The controlling apparatus of Claim 21 further comprising:

25 an instance generator for instantiating initial snapshots or intermediate snapshots.

23. The controlling apparatus of Claim 21, further comprising:

- 42 -

a storage processor for storing the intermediate snapshot in a repository adapted to store one or more intermediate snapshots each generated from a respective running snapshot and being further adapted to store an initial snapshot.

24. The controlling apparatus of Claim 23 further comprising:

5        an instance generator for instantiating the initial snapshot or one of the intermediate snapshots in the repository.

25. The controlling apparatus of Claim 21, wherein the running snapshot associated with said snapshot is the source snapshot.

26. The controlling apparatus of Claim 21, wherein the running snapshot  
10       associated with said snapshot is generated from the source snapshot.

27. The controlling apparatus of Claim 23, wherein the running snapshot associated with said source snapshot is an intermediate snapshot stored in the repository.

28. The controlling apparatus of Claim 23, wherein the running snapshot  
15       associated with said source snapshot is generated from an intermediate snapshot stored in the repository.

29. An access configuration apparatus for providing access to a blade associated with a blade server via at least one virtual bridged Local Area Network (LAN), the apparatus comprising:

20       a switch configuration device for configuring a switch coupled to said blade server for allowing access to said at least one virtual bridged LAN; and

         an agent loader for loading an agent to said blade, the agent being configured to provide access to said at least one virtual bridged LAN, configured on the switch by the switch configuration device.

30. A blade access configuration apparatus for providing access to a blade associated with a blade server via at least one virtual bridged Local Area Network (LAN), the apparatus comprising:

an agent configuration device for configuring an image of an agent for  
5 providing access to said at least one virtual bridged LAN; and

an agent loader for loading an instance of said image to said blade for allowing said blade to access said at least one virtual bridged LAN, configured by the agent configuration device.

31. An apparatus for providing access to a blade associated with a blade server  
10 via at least one virtual bridged Local Area Network (LAN), the apparatus comprising:

a monitoring unit for monitoring a Network Interface Card (NIC) coupled to said blade; and

packet encoder for encoding network packets received on said NIC for  
15 providing said blade with access to said at least one virtual bridged LAN.

32. The apparatus of Claim 31, wherein said monitoring unit includes:

a network failure protection unit coupled to said NIC, for observing idle  
duration of the NIC, and migrating to a redundant NIC for providing network  
failure protection if said idle duration is substantially longer than a predefined  
20 duration.

33. The apparatus of Claim 32, wherein:

the network failure protection unit is coupled to an agent, which is adapted to convey an indication of said migrating to a controller coupled to the blade server.

25 34. An apparatus for providing network fault tolerance to at least one instance loaded to a blade installed in a blade server, the apparatus comprising:

a migration detector for receiving a migration indication from said blade;

- 44 -

a switch status detection unit for detecting status of a switch associated with said blade server having access to said blade; and

a bypass generator for bypassing a connection between said switch and said blade.

5    35.    The apparatus of Claim 34 further comprising:

a switch fault alerts generator for alerting one or more faults in said switch.

36.    The apparatus of Claim 34 further comprising:

10    an instance fault tolerance unit loading said at least one instance on to a different blade in said blade server.

37.    The apparatus of Claim 36 further comprising:

a blade fault alerts generator for alerting one or more faults in said blade.

38.    A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for  
15    controlling at least one executable on a blade server having a controller accessible to the blade server and to at least one blade having access to a storage device in association with said controller, said controller having access to a source snapshot of the at least one executable stored on the storage device, the method comprising:

20    selecting an available one of said blades for loading an instance of a running snapshot associated with said source snapshot; and

loading the instance of the running snapshot to the available one of said blades.

39.    A computer program product comprising a computer useable medium  
25    having computer readable program code embodied therein for controlling at least one executable on a blade server having a controller accessible to the blade server and to at least one blade having access to a storage device in association with said

controller, said controller having access to a source snapshot of the at least one executable stored on the storage device, the computer program product comprising:

5 computer readable program code for causing the computer to select an available one of said blades for loading an instance of a running snapshot associated with said source snapshot; and

computer readable program code for causing the computer to load the instance of the running snapshot to the available one of said blades.

40. A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for  
10 configuring a switch associated with a blade server for providing access to at least one virtual bridged Local Area Network (LAN), the method comprising:

accessing configuration data stored on an accessible storage device; and

15 relaying said configuration data to said switch for providing access to said at least one virtual bridged LAN.

41. A computer program product comprising a computer useable medium having computer readable program code embodied therein for configuring a switch associated with a blade server for providing access to at least one virtual bridged Local Area Network (LAN), the computer program product comprising:

20 computer readable program code for causing the computer to access configuration data stored on an accessible storage device; and

computer readable program code for causing the computer to relay said configuration data to said switch for providing access to said at least one virtual bridged LAN.

25 42. A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for



- 46 -

providing access to a blade associated with a blade server via at least one virtual bridged Local Area Network (LAN), the method comprising:

configuring an image of agent for providing access to said at least one virtual bridged LAN; and

5 loading an instance of said image to said blade for allowing said blade to access said at least one virtual bridged LAN.

43. A computer program product comprising a computer useable medium having computer readable program code embodied therein for providing access to a blade associated with a blade server via at least one virtual bridged Local Area  
10 Network (LAN), the computer program product comprising:

computer readable program code for causing the computer to configure an image of agent for providing access to said at least one virtual bridged LAN; and

15 computer readable program code for causing the computer to load an instance of said image to said blade for allowing said blade to access said at least one virtual bridged LAN.

44. A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for providing access to a blade associated with a blade server via at least one virtual  
20 bridged Local Area Network (LAN), the method comprising:

monitoring a Network Interface Card (NIC) coupled to said blade; and  
encoding network packets received on said NIC for providing said blade with access to said at least one virtual bridged LAN.

45. A computer program product comprising a computer useable medium  
25 having computer readable program code embodied therein for providing access to a blade associated with a blade server via at least one virtual bridged Local Area Network (LAN), the computer program product comprising:

- 47 -

computer readable program code for causing the computer to monitor a Network Interface Card (NIC) coupled to said blade; and

computer readable program code for causing the computer to encode network packets received on said NIC for providing said blade with access to  
5 said at least one virtual bridged LAN.

46. A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for providing tolerance to at least one executable loaded to a blade accessible to a blade server, the method comprising:

10 receiving data indicative of migration of said blade to a redundant NIC;  
detecting the operating status of a switch accessible by said blade; and  
if the detected operating status indicates that said switch is not operating for a predetermined duration, bypassing a connection between said switch and said blade.

15 47. A computer program product comprising a computer useable medium having computer readable program code embodied therein for providing tolerance to at least one executable loaded to a blade accessible to a blade server, the computer program product comprising:

computer readable program code for causing the computer to receive data  
20 indicative of migration of said blade to a redundant NIC;

computer readable program code for causing the computer to detect the operating status of a switch accessible by said blade; and

computer readable program code for causing the computer to bypass a connection between said switch and said blade, if the detected operating status  
25 indicates that said switch is not operating for a predetermined duration.